

Researchers Should Consider How Disparities Change Over Time and Space: Lessons from the COVID-19 Pandemic

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The coronavirus disease 2019 (COVID-19) pandemic has revealed significant racial/ethnic inequalities in numerous aspects of American society. However, the massive disruption and upheaval to daily life caused by the pandemic can also present a unique moment in history for leaders to examine and combat systemic inequality. In April 2020, less than 2 months into the pandemic, several states and large cities released initial data that illustrate a starkly different reality: COVID-19 mortality was higher among Black individuals than other racial/ethnic groups [1]. This finding was hardly surprising—and even expected—to public health researchers and practitioners. Pandemics and other acute disasters intensify existing inequalities and reveal fractures in our society that leave those who are socially disadvantaged even more vulnerable. Since then, numerous studies have found that African American and Latinx individuals are significantly more likely to contract, have serious complications, and die from COVID-19 than their White counterparts [2].

Most of these studies analyzed racial/ethnic differences in COVID-19 outcomes (e.g., infection, hospitalization, mortality) as “static” phenomena. That is, they did not consider how these disparities varied over time and space. Implicit to this traditional approach to analyzing disparities is that patterns in health disparities have reached an “equilibrium” with risks. While this may be valid when analyzing chronic disease states, the weekly ebb and flow of, and responses to, the COVID-19 pandemic have been far from “static.” In this paper, we highlight the importance of considering racial/ethnic disparities in the COVID-19 pandemic in the context of time and space.

Why Consider Variation by Time?

The responses to the pandemic—from risk mitigation policies to therapeutic approaches to individual behaviors—have changed markedly during the course of the pandemic in response to knowledge about the virus and changes in infection risk. While these responses are intended to reduce overall COVID-19 infection, hospitalization, and mortality, albeit while balancing social isolation concerns, it is important to consider how these advances affect disparities and how they might inadvertently exacerbate them. Crucially, this information can also guide stakeholders’ decisions about how to implement policies, practices, and messaging to close the gap in racial/ethnic disparities.

Some responses that arose directly from increased awareness of these disparities, such as partnerships with community organizations and community health workers, have likely helped reduce disparities. However, it is less clear how other responses have affected racial/ethnic disparities. For example, although therapeutic approaches have significantly decreased mortality overall, less well-resourced hospitals that often serve communities of color cannot access these therapies and are understaffed, making it challenging to care for COVID-19 patients [3]. Additionally, state and local governments periodically enacted social distancing policies and business closures to slow COVID-19 transmission, but it is possible that racial/ethnic disparities may increase when these policies are enacted because essential workers, who are more likely to be racial/ethnic minority individuals, have fewer opportunities to telework [4]. It is likely that the sectors of the service industry that expanded with the pandemic, such as grocery delivery and boxing products from large ware-

houses, essentially shifted risk from economically well-off groups to the more socially vulnerable.

The authors of this paper recently examined time trends in racial/ethnic disparities in COVID-19 infection and mortality among a national cohort of veterans over three time periods from March to November 2020, where the time periods correspond approximately to spring, summer, and fall [5]. The authors found that disparities changed over time, and importantly, more racial/ethnic groups experienced disparities in the summer months after considering differences in age, gender, and prior diagnosis of Centers for Disease Control and Prevention-identified risk factors for severe outcomes with COVID-19. In particular, the authors found that while only African American veterans had a higher risk of COVID-19 infection in the spring compared to White veterans, in the summer months, African American, Latinx, American Indian/Alaska Native, and Native Hawaiian/Other Pacific Islander veterans were all more likely to be infected with COVID-19 than their White counterparts. By the fall, infection rates remained higher only among American Indian/Alaska Native veterans. Additionally, mortality decreased by about 80 percent over time but not uniformly across all groups. Although the authors did not examine explicitly how these disparities changed with changes in social distancing policies and business closures and re-openings, during the summer months many states did in fact relax these policies and allowed for more business re-openings, along with summer travel. These findings highlight the need to consider changes in time, and potentially more explicitly how specific changes at specific time points have affected disparities.

Why Consider Variation by Geography?

Considering racial/ethnic differences in COVID-19 outcomes that reflect national or state levels may mask substantial variation in disparities that exist at the local level. The local context, including urbanicity and crowding, racial/ethnic composition, degree of segregation, and local industries, can affect racial/ethnic disparities and solutions to mitigate them. For example, it is possible that disparities among African American and Latinx individuals may be larger in urban areas where they are more likely to live in crowded housing compared to their White counterparts. Disparities among Latinx individuals may potentially also be larger in highly rural areas where agriculture is a dominant industry, as Latinx individuals comprise a large proportion of the agricultural workforce that is not able to work from home or socially distance while at work.

The interaction of time and geography is also important. Early in the pandemic, most rural COVID-19 cases were located in counties with prisons, meatpacking plants, or Indian reservations. During the summer, rural counties with high proportions of African American and Latinx residents were disproportionately affected, but by the fall, COVID-19 cases were prevalent throughout the rural heartland [6,7]. This diffusion of COVID-19 across rural America over time contributed to the changes in racial/ethnic disparities observed at different times.

Conclusion

The COVID-19 pandemic has illustrated the dynamic nature of some racial/ethnic disparities, yet few studies have incorporated this element into their analytical design. The traditional approach to examining disparities as static and uniform is inadequate and may potentially mask disparities. Unintended consequences of health and public policies may disproportionately favor privileged groups or disadvantage vulnerable groups, leading to the emergence of new or worsening disparities over time. Going forward, it will be important for health equity researchers and policy makers to consider racial/ethnic disparities in the context of time and place for COVID-19. Furthermore, future pandemics, as well as other emergent and rapidly evolving disaster events, are likely to also disproportionately affect racial/ethnic groups that are already vulnerable and disadvantaged; it is likely that these disparities will also evolve over time and place. Examining racial/ethnic disparities as dynamic phenomena is crucial for stakeholders making emergency policy, risk mitigation, and treatment decisions to ensure that these decisions do not inadvertently exacerbate racial/ethnic inequalities.

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